

Screen Readers and Designing Accessible Websites

Our Society has benefited in many ways from the information technology revolution. However, not everyone can reap the benefits of this technology change unless websites are developed to serve the largest possible audience that includes persons with disabilities. Increasing the target audience shall be done by using different hardware and software platforms, connectivity, devices, etc.



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It is now being felt world over that it is the responsibility of every web site developer to design 'Barrier-Free' Websites to ensure that people with disabilities have equal access to public information that is available on the Internet and the World Wide Web.

Web Accessibility

Accessibility caters to the needs of people with impairments like Visual, Hearing, Mobility, Learning, Elderly. Such audience requires special technology to assist them in rendering or viewing a webpage. The technology meant to help this section of users is called Assistive Technology (AT) and the related devices/software are called Assistive Devices (ADs).

Visually challenged users require an output of synthetic voice and those with low vision or dyslexia may need large text or spatial adjustments. Hearing impaired may require text equivalents for audio information. The mobility challenged may require the ability to browse without the use of keyboard, mouse, or input device that requires a part of their body other than just their eyes or mouth.

Assistive Devices (ADs) for people with disabilities include screen

magnifiers, screen readers, synthetic speech, caption-ready monitors, or alternative keyboards. This article focuses on designing web pages that can be read easily by the screen readers enabling visually challenged people to access the information presented on them.

Screen Readers

Screen Readers are assistive devices that convert text into synthesized speech to facilitate visually impaired users to listen to and comprehend the content on a webpage. A screen reader typically reads the page from top to bottom and left to right. Beyond the task of reading, the screen reader allows users to navigate through Web content using different shortcut keys which provide a variety of choices like reading everything from top to bottom, one line at a time, or the user can use the tab key to navigate from link to link. The user can also navigate from one heading to the next (e.g. by pressing 'h' key with jaws) or from one frame to the next. Today the screen readers are even configurable and allow the users to control parameters such as the reading speed, accent and the way to read out the content (e.g. whether to read out the pronunciations or not).

Screen Reader	Website	Free/Commercial
Screen Access For All (SAFA)	http://www.nabdelhi.org/NAB_SAFA.htm	Free
Thunder	http://www.screenreader.net/index.php	Free
WebAnywhere	http://webanywhere.cs.washington.edu/wa.php	Free
JAWS	http://www.freedomscientific.com/jaws-hq.asp	Commercial
Supernova	http://www.yourdolphins.co.uk	Commercial
Window-Eyes	http://www.gwmicro.com/Window-Eyes/	Commercial

Designing accessible website

Sighted users can scan an entire screen almost instantaneously while screen readers present content to users, one item at a time. The linear progression through the content from beginning to end is somewhat like Interactive Voice Response Systems (IVRS) which do not reveal all of the options at once and users must progress through such systems in a step-wise manner. The fact that screen readers present linearized versions of web content is an important one that should guide Web developers during the design process.

The following points should be kept in mind so that the content is meaningfully presented and can be navigated easily by the to the screen reader user.

- Correct and relevant title should be given to every page. This is important as screen readers first read the title of the page
- Clear heading structure (H1, H2 and H3) should be maintained. This helps the visually challenged user to quickly scan the main content heads of the page. There should be only one H1 tag on a page.
- A “Skip to content” link must be provided at the top of the page. This helps the user to directly go to the main content of the page bypassing the repetitive sections like page header, navigations etc.
- Short, meaningful descriptive text for links must be provided. Using functional text descriptions provides better navigation and coherent feedback to users who rely on the screen readers to read a page.
- Meaningful text descriptions must be provided for non text elements like images by giving an ALT tag. For decorative images like icons, bullets etc. a null ALT must be given (ALT=” ”) as Screen readers ignore images without alt text. A video presentation with an audio component requires captioning. The captioning must be completely synchronized with the audio presentation to allow for the viewer to follow the meaning of the content. If there is a slide show like a PowerPoint slide show available but it is “visual only”, the graphics need to have alternative text representations.
- All functionality of the content should be operable through a keyboard interface as the visually challenged cannot use the mouse.
- Avoid using tables for layout and presentation purposes. When used for representing data, tables should be provided with proper header row and captions and the data items should flow left to right, one line at a time.
- Frames should be avoided while designing a webpage as frames cannot be easily read by the visually impaired. When used, frames should be titled with text that facilitates frame identification and navigation.
- While designing a form it must be ensured that text instructions that describe the input are provided at the beginning of a form or set of fields. Also elements associated with input like text fields must be labeled to ensure that information about the input field is spoken by screen readers when the field receives focus.
- If an input error is detected, the error must be described to the user in text so that it can be read by the screen reader. The error message should be precisely presented. This will ensure that users are

aware that an error has occurred and can determine what is wrong.

- Attributes of colour, shape and size must not be used to represent information as these would make the content inaccessible to the visually challenged. For example, we should avoid using statements like “All the text written in red are mandatory”.
- For all user interface components, the name and role should be programmatically determined; states, properties, and values can be programmatically set; and notification of changes to these items is available to screen readers. For example is there is a checkbox control on the page and its state is checked then screen reader should be able to read its name and state.
- While using scripting languages to display content, or to create interface elements, the information provided by the script must be identified with functional text that can be read by assistive technology. All JavaScript URLs should have meaningful text so as to be useful for people with

disabilities to follow. Use of event handlers like OnClick(), OnChange() etc. as the only method for navigating or completing a page should be avoided. Although event handlers that require no user interaction like OnLoad() is not problematic.

- All script function should include a NOSCRIPT tag for those browsers or assistive technologies that do not have script support.
- Whenever using CAPTCHA code for security on your web page, use one that can be read/ understood by people using screen readers. An example of such text based CAPTCHA is available at <http://india.gov.in/suggest/suggest.php>

Technology like screen readers are quite robust in their capabilities and make reading and interpretation possible as well easy for the visually challenged. They are boon from the world of technology for the visually challenged enabling them to access the digital contents. Accessibility is an important idea behind many web standards. Designing accessible websites will help in creating an inclusive digital world. **i**

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additional districts/states having clusters of MAH units for national perspective.

Promotion of IT enabled services for according clearances.

Keeping in view the recommendations of the high powered committee, a workflow based web portal may be developed and deployed in the Ministry with an aim to provide comprehensive, accurate, and online information to the public on various clearances (EC/FC/CRZ). This portal shall host a suite of online applications (for granting various clearances) that can be used by the authenticated users as per the assigned roles and privileges. The proponent/User Agency may submit application (for seeking clearance) online and the same could be forwarded to the concerned head of the sector as defined in the flow for the decision. This portal may have the option of uploading the contents

by various stakeholders. Thus all the clearances related with different sectors (e.g. Environment, Forests, CRZ etc.) could be granted through a single window.

Generic model on consent management developed for State Pollution Control Boards could also be integrated with this portal, so that NOC for Consent to Establishment and Consent to Operate along with other components could also be granted through this portal

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